TEJUS
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Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	WMM	**Date of Sampling**	**19-08-2021**
Sample Location	Tirumenahalli Road	**Date of Testing**	**20-08-2021**

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	376.00	366.00	339.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	279.00	274.00	252.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	97.00	92.00	87.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	25.80	25.14	25.66	
5	Average Aggregate impact value	(%)	25.53			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

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TEJUS CONSULTANTS

Consultant's Representative

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tejusconsultants@gmail.com

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TEJUS
CONSULTANTS

Name of Work	:	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	20-08-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 6

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	Tirumenahalli Road	Date of Sampling:	19-08-2021
		Date of testing:	20-08-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	390	390	3.90	96.10	95-100
22.4	1785	2175	21.75	78.25	60-80
11.2	2586	4761	47.61	52.39	40-60
4.75	2020.0	6781	67.81	32.19	25-40
2.36	790.0	7571	75.71	24.29	15-30
0.6	820.0	8391	83.91	16.09	8.0-22.0
0.075	991.0	9382	93.82	6.18	0-8
Pan	618.0	10000			
Total	10000.0				

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Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	Tirumenhalli Road	**Date of Sampling**	**19-08-2021**
		Date of Testing	**20-08-2021**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	611	84	522	75
16.0	12.5	1130	116	978	109
12.5	10.0	778	57	730	55
10.0	6.3	615	66	562	49
Total		**3134**	**323**	**2792**	**288**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.31
Elongation Index(%):	10.32
Combined FI+EL (%)	20.62

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Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**23-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**Tirumenahalli Road at Ch:182**	**Tirumenahalli Road at Ch:270**
Wt. of wet material from hole (Ww) gms.	5986	5992
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10595	10592
Wt. of sand in hole+ cone (w3) gms.	4405	4408
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3325	3328
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.38	2.38
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.24	2.24
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.48	98.49
% compaction required	98%	98%

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Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)

	Date:	**23-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**Tirumenahalli Road at Ch:42**	**Tirumenahalli Road at Ch:110**
Wt. of wet material from hole (Ww) gms.	5978	5985
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10597	10592
Wt. of sand in hole+ cone (w3) gms.	4403	4408
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3323	3328
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.40	6.20
Result		
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.23	2.24
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.32	98.47
% compaction required	98%	98%

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Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**24-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**Tirumenahalli Road at Ch:335**	**Tirumenahalli Road at Ch:440**
Wt. of wet material from hole (Ww) gms.	5982	5977
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10590	10593
Wt. of sand in hole+ cone (w3) gms.	4410	4407
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3330	3327
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.23	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.27	98.28
% compaction required	98%	98%

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Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**24-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**Tirumenahalli Road at Ch:495**	**Tirumenahalli Road at Ch:572**
Wt. of wet material from hole (Ww) gms.	5982	5978
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10586	10595
Wt. of sand in hole+ cone (w3) gms.	4414	4405
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3334	3325
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.23	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.15	98.35
% compaction required	98%	98%

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BRUHAT BANGALORE MAHANAGARA PALIKE

BYTARAYANPURA DIVISION

Name of Work: Package 2 Consists of 3 Works of Rs.1100.00 Lakhs

2.Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division.

TEST REPORTS

FIRST & PART BILL

TEJUS CONSULTANTS

CONSULTING ENGINEERS AND DESIGNERS

No.58 MIG, 6th Cross, 3rd Main

1st Stage, Basaveshwaranagar

Bangalore-560079

☎ 080 - 23287532

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CONSULTANTS

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Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	04-08-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 2

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	7th Cross Road	Date of Sampling:	03-08-2021
		Date of testing:	04-08-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	390	390	3.90	96.10	95-100
22.4	2382	2772	27.72	72.28	60-80
11.2	2483	5255	52.55	47.45	40-60
4.75	1456.0	6711	67.11	32.89	25-40
2.36	792.0	7503	75.03	24.97	15-30
0.6	850.0	8353	83.53	16.47	8.0-22.0
0.075	991.0	9344	93.44	6.56	0-8
Pan	656.0	10000			
Total	10000.0				

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Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	04-08-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 3

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	8th Cross Road	Date of Sampling:	03-08-2021
		Date of testing:	04-08-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	369	369	3.69	96.31	95-100
22.4	2412	2781	27.81	72.19	60-80
11.2	2436	5217	52.17	47.83	40-60
4.75	1487.0	6704	67.04	32.96	25-40
2.36	788.0	7492	74.92	25.08	15-30
0.6	842.0	8334	83.34	16.66	8.0-22.0
0.075	982.0	9316	93.16	6.84	0-8
Pan	684.0	10000			
Total	10000.0				

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Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	04-08-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 4

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	9th Cross Road	Date of Sampling:	03-08-2021
		Date of testing:	04-08-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	376	376	3.76	96.24	95-100
22.4	2385	2761	27.61	72.39	60-80
11.2	2489	5250	52.50	47.50	40-60
4.75	1599.0	6849	68.49	31.51	25-40
2.36	774.0	7623	76.23	23.77	15-30
0.6	809.0	8432	84.32	15.68	8.0-22.0
0.075	992.0	9424	94.24	5.76	0-8
Pan	576.0	10000			
Total	10000.0				

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Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	04-08-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 1

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	6th Cross Road	Date of Sampling:	03-08-2021
		Date of testing:	04-08-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	376	370	3.70	96.30	95-100
22.4	1795	2165	21.65	78.35	60-80
11.2	2256	4421	44.21	55.79	40-60
4.75	2019.0	6440	64.40	35.60	25-40
2.36	1395.0	7835	78.35	21.65	15-30
0.6	775.0	8610	86.10	13.90	8.0-22.0
0.075	880.0	9490	94.90	5.10	0-8
Pan	510.0	10000			
Total	10000.0				

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Consultant's Representative

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	WMM	**Date of Sampling**	03-08-2021
Sample Location	8th Cross Roads,MS Nagara	**Date of Testing**	04-08-2021

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	368.00	359.00	337.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	274.00	269.00	251.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	94.00	90.00	86.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	25.54	25.07	25.52	
5	Average Aggregate impact value	(%)	25.38			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	WMM	**Date of Sampling**	03-08-2021
Sample Location	8th Cross Roads,MS Nagara	**Date of Testing**	04-08-2021

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	368.00	359.00	337.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	274.00	269.00	251.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	94.00	90.00	86.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	25.54	25.07	25.52	
5	Average Aggregate impact value	(%)	25.38			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material		WMM		**Proposed Use**	**WMM**
Sample Location		7th Cross Roads		**Date of Sampling**	**03-08-2021**
				Date of Testing	**04-08-2021**
Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	625	81	523	75
16.0	12.5	1136	120	1005	122
12.5	10.0	763	68	736	53
10.0	6.3	618	58	572	45
Total		**3142**	**327**	**2836**	**295**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.41
Elongation Index(%):	10.40
Combined FI+EL (%)	20.81

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Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	6th Cross Roads	**Date of Sampling**	**03-08-2021**
		Date of Testing	**04-08-2021**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	641	76	540	76
16.0	12.5	1136	126	981	105
12.5	10.0	774	58	732	53
10.0	6.3	618	66	542	49
Total		**3169**	**326**	**2795**	**283**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.29
Elongation Index(%):	10.13
Combined FI+EL (%)	20.41

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	8th Cross Roads	**Date of Sampling**	**03-08-2021**
		Date of Testing	**04-08-2021**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	611	84	523	70
16.0	12.5	1132	123	966	116
12.5	10.0	772	58	735	52
10.0	6.3	614	60	560	48
Total		**3129**	**325**	**2784**	**286**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.39
Elongation Index(%):	10.27
Combined FI+EL (%)	20.66

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**04-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**8th Cross Road at Ch:120**	**8th Cross Road at Ch:210**
Wt. of wet material from hole (Ww) gms.	5989	5980
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10591	10592
Wt. of sand in hole+ cone (w3) gms.	4409	4408
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3329	3328
Bulk density of sand (γs)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.40	6.20
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.23	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.32	98.39
% compaction required	98%	98%

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**04-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**9th Cross Road at Ch:45**	**9th Cross Road at Ch:105**
Wt. of wet material from hole (Ww) gms.	5988	5970
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10596	10596
Wt. of sand in hole+ cone (w3) gms.	4404	4404
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3324	3324
Bulk density of sand (γs)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.38	2.37
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.24	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.55	98.25
% compaction required	98%	98%

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Project	Improvements to roads and drains at Agrahara and surrounding areas in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
Date of Testing	**04-08-2021**	
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**6th Cross Road at Ch:65**	**6th Cross Road Road at Ch:103**
Wt. of wet material from hole (Ww) gms.	5987	5978
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10586	10596
Wt. of sand in hole+ cone (w3) gms.	4414	4404
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3334	3324
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.20	6.40
Result		
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.23	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.33	98.29
% compaction required	98%	98%

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Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART I)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	1st cross Road	**Date of Sampling**	**20-07-2021**
		Date of Testing	**21-07-2021**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	615	86	523	73
16.0	12.5	1132	123	966	116
12.5	10.0	772	55	735	52
10.0	6.3	618	63	566	48
Total		**3137**	**327**	**2790**	**289**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.42
Elongation Index(%):	10.36
Combined FI+EL (%)	20.78

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Name of Work	:	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	21-07-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 3

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	1st cross Road	Date of Sampling:	20-07-2021
		Date of testing:	21-07-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	367	367	3.67	96.33	95-100
22.4	2415	2782	27.82	72.18	60-80
11.2	2432	5214	52.14	47.86	40-60
4.75	1489.0	6703	67.03	32.97	25-40
2.36	790.0	7493	74.93	25.07	15-30
0.6	845.0	8338	83.38	16.62	8.0-22.0
0.075	982.0	9320	93.20	6.80	0-8
Pan	680.0	10000			
Total	10000.0				

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Project	Improvements to roads and drains at Kogilu and surrounding areas in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**21-07-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**4th cross at Ch:52**	**4th cross at Ch:95**
Wt. of wet material from hole (Ww) gms.	5977	5978
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10595	10594
Wt. of sand in hole+ cone (w3) gms.	4405	4406
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3325	3326
Bulk density of sand (γs)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.23	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.33	98.32
% compaction required	98%	98%

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Consultant's Representative

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ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
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TEJUS
CONSULTANTS

Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division	
Client	Brahat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**21-07-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**5th cross at Ch:35**	**5th cross at Ch:102**
Wt. of wet material from hole (Ww) gms.	5990	5969
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10592	10595
Wt. of sand in hole+ cone (w3) gms.	4408	4405
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3328	3325
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.38	2.37
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.24	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.46	98.20
% compaction required	98%	98%

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TEJUS
CONSULTANTS

Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**21-07-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**6th C cross at Ch:45**	**6th C cross at Ch:92**
Wt. of wet material from hole (Ww) gms.	5983	5978
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10590	10593
Wt. of sand in hole+ cone (w3) gms.	4410	4407
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3330	3327
Bulk density of sand (γs)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.40	6.20
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.23	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.19	98.38
% compaction required	98%	98%

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Consultant's Representative

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Name of Work	:	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	22-07-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 4

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	5th cross road	**Date of Sampling:**	21-07-2021
		Date of testing:	22-07-2021
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	374	374	3.74	96.26	95-100
22.4	2380	2754	27.54	72.46	60-80
11.2	2485	5239	52.39	47.61	40-60
4.75	1599.0	6838	68.38	31.62	25-40
2.36	770.0	7608	76.08	23.92	15-30
0.6	809.0	8417	84.17	15.83	8.0-22.0
0.075	992.0	9409	94.09	5.91	0-8
Pan	591.0	10000			
Total	10000.0				

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Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**22-07-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**1st cross at Ch:36**	**1st cross at Ch:105**
Wt. of wet material from hole (Ww) gms.	5977	5996
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10595	10592
Wt. of sand in hole+ cone (w3) gms.	4405	4408
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3325	3328
Bulk density of sand (γs)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.37	2.38
Moisture meter reading(moisture content)	6.40	6.20
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.23	2.24
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.24	98.65
% compaction required	98%	98%

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Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	WMM	**Date of Sampling**	13-08-2021
Sample Location	Tirumenahalli Road	**Date of Testing**	14-08-2021

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	379.00	355.00	385.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	286.00	267.00	289.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	93.00	88.00	96.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	24.54	24.79	24.94	
5	Average Aggregate impact value	(%)	24.75			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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ಬ್ಯಾಟರಾಯನಪುರ ಘಟಕ ನಿಧಾನ
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TEJUS
CONSULTANTS

Name of Work	:	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	14-08-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 5

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	Tirumenahalli Road	Date of Sampling:	13-08-2021
		Date of testing:	14-08-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	352	352	3.52	96.48	95-100
22.4	1799	2151	21.51	78.49	60-80
11.2	2245	4396	43.96	56.04	40-60
4.75	2019.0	6415	64.15	35.85	25-40
2.36	1389.0	7804	78.04	21.96	15-30
0.6	775.0	8579	85.79	14.21	8.0-22.0
0.075	892.0	9471	94.71	5.29	0-8
Pan	529.0	10000			
Total	10000.0				

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Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	Tirumenhalli Road	**Date of Sampling**	**13-08-2021**
		Date of Testing	**14-08-2021**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	605	82	522	73
16.0	12.5	1148	122	982	114
12.5	10.0	776	56	725	56
10.0	6.3	619	60	566	48
Total		**3148**	**320**	**2795**	**291**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.17
Elongation Index(%):	10.41
Combined FI+EL (%)	20.58

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Project	Improvements to roads and drains at Agrahara and surrounding areas in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	04-08-2021
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	1	2
Chainage	**7th Cross Road at Ch:90**	**7th Cross Road at Ch:195**
Wt. of wet material from hole (Ww) gms.	5992	5987
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10596	10588
Wt. of sand in hole+ cone (w3) gms.	4404	4412
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3324	3332
Bulk density of sand (γs)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.38	2.37
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.24	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.61	98.29
% compaction required	98%	98%

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Consultant's Representative

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	Connecting Road to 3rd Main	**Date of Sampling**	**07-08-2021**
		Date of Testing	**08-08-2021**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	608	82	522	70
16.0	12.5	1148	120	982	115
12.5	10.0	776	56	720	56
10.0	6.3	619	61	562	48
Total		**3151**	**319**	**2786**	**289**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.12
Elongation Index(%):	10.37
Combined FI+EL (%)	20.50

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TEJUS
CONSULTANTS

Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	Connecting Road 1 to 3rd Main End Road MS Nagara	**Date of Sampling**	**07-08-2021**
		Date of Testing	**08-08-2021**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	611	85	522	75
16.0	12.5	1125	116	978	109
12.5	10.0	778	57	725	58
10.0	6.3	615	64	566	49
Total		**3129**	**322**	**2791**	**291**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.29
Elongation Index(%):	10.43
Combined FI+EL (%)	20.72

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Name of Work	:	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	08-08-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 6

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	Connecting Road 1 to 3rd Main End Road MS Nagara	Date of Sampling:	07-08-2021
		Date of testing:	08-08-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	390	390	3.90	96.10	95-100
22.4	1786	2176	21.76	78.24	60-80
11.2	2585	4761	47.61	52.39	40-60
4.75	2014.0	6775	67.75	32.25	25-40
2.36	792.0	7567	75.67	24.33	15-30
0.6	824.0	8391	83.91	16.09	8.0-22.0
0.075	990.0	9381	93.81	6.19	0-8
Pan	619.0	10000			
Total	10000.0				

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TEJUS CONSULTANTS

Consultant's Representative

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಧಿಯಂತರರು
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ಬಿ.ಬಿ.ಎಂ.ಪಿ., ಬೆಂಗಳೂರು-24

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TEJUS
CONSULTANTS

Name of Work	:	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	08-08-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 5

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	Connecting Road to 3rd Main	Date of Sampling:	07-08-2021
		Date of testing:	08-08-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	352	352	3.52	96.48	95-100
22.4	1796	2148	21.48	78.52	60-80
11.2	2264	4412	44.12	55.88	40-60
4.75	2001.0	6413	64.13	35.87	25-40
2.36	1139.0	7552	75.52	24.48	15-30
0.6	792.0	8344	83.44	16.56	8.0-22.0
0.075	892.0	9236	92.36	7.64	0-8
Pan	764.0	10000			
Total	10000.0				

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Consultant's Representative

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Project	Improvements to roads and drains at Agrahara and surrounding areas in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**08-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**Connecting Rd to 2nd Main Rd MS nagara at Ch:5**	**Connecting Rd to 2nd Main Rd MS nagara at Ch:24**
Wt. of wet material from hole (Ww) gms.	5982	5978
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10593	10596
Wt. of sand in hole+ cone (w3) gms.	4407	4404
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3327	3324
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.23	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.36	98.38
% compaction required	98%	98%

Consultant's Representative

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TEJUS

Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**08-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**Connecting Rd to 3rd Mn MS nagara at Ch:60**	**Connecting Rd to 3rd Mn MS nagara at Ch:180**
Wt. of wet material from hole (Ww) gms.	5978	5989
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10596	10591
Wt. of sand in hole+ cone (w3) gms.	4404	4409
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3324	3329
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.40	6.20
Result		
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.23	2.24
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.29	98.51
% compaction required	98%	98%

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TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**08-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**Connecting Rd-1 to MS Nagara 3rd Main End Road at Ch:105**	**Connecting Rd-1 to MS Nagara 3rd Main End Road at Ch:180**
Wt. of wet material from hole (Ww) gms.	5988	5978
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10595	10596
Wt. of sand in hole+ cone (w3) gms.	4405	4404
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3325	3324
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.38	2.37
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.24	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.52	98.38
% compaction required	98%	98%

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)

	Date:	**08-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**2nd Main Rd MS nagara at Ch:41**	**2nd Main Rd MS nagara at Ch:108**
Wt. of wet material from hole (Ww) gms.	5979	5990
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10596	10591
Wt. of sand in hole+ cone (w3) gms.	4404	4409
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3324	3329
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.38
Moisture meter reading(moisture content)	6.40	6.20
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.23	2.24
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.30	98.52
% compaction required	98%	98%

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Project	Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)

	Date:	**08-08-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**3rd Main Rd MS nagara at Ch:24**	**3rd Main Rd MS nagara at Ch:51**
Wt. of wet material from hole (Ww) gms.	5979	5991
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10595	10595
Wt. of sand in hole+ cone (w3) gms.	4405	4405
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3325	3325
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.38
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.23	2.24
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.37	98.56
% compaction required	98%	98%

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BRUHAT BANGALORE MAHANAGARA PALIKE

BYTARAYANPURA DIVISION

Name of Work: Package 2 Consists of 3 Works of Rs.1100.00 Lakhs

1.Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division.
2.Improvements to roads and drains at Agrahara and surrounding area in Ward No 05 Byatarayanapura sub division.
3.Improvements to roads and drains at Hegdenagar and surrounding area in Ward No 06 Byatarayanapura sub division.

TEST REPORTS

FIRST & PART BILL

TEJUS CONSULTANTS
CONSULTING ENGINEERS AND DESIGNERS
No.58 MIG, 6th Cross, 3rd Main
1st Stage, Basaveshwaranagar
Bangalore-560079
☎ 080 - 23287532
email: tejusconsultants@gmail.com

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TEJUS
CONSULTANTS

No.TC/BBMP/BYT-PMC/472 /21-22

Date:

To
The Executive Engineer
Byatarayanapura Division,
NH-7 Road, Bangalore – 560 092

Dear Sir

Sub: Improvements to roads and drains at Kogilu, Agrahara, Hegdenagar and surrounding area in Ward No 05 and 06 Byatarayanapura sub division Package-02

In reference to the above subject, this is to bring to your kind notice that we have scrutinized the **First and Part bill** submitted by M/s. Benaka Developers and Projects Pvt Ltd towards the above said work and arrived at an amount of **1,97,20,873.76 (Rupees One Crore Ninety Seven Lakhs Twenty Thousand Eight Hundred and Seventy Three and Seventy Six Paisa Only)** the work has been completed satisfactorily.

This is for your kind information.

Thank you and assuring you the best of our Services at all the times

TEJUS CONSULTANTS

For Tejus Consultants
(Nischal M)

AE ward No 5 & 6
ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
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BRUHAT BANGALORE MAHANAGARA PALIKE
BYTARAYANPURA DIVISION

Name of Work: Package 2 Consists of 3 Works of Rs.1100.00 Lakhs

1.Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division

TEST REPORTS

FIRST & PART BILL

TEJUS CONSULTANTS
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Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	WMM	**Date of Sampling**	16-07-2021
Sample Location	9th c/s Road	**Date of Testing**	17-07-2021

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	359.00	368.00	342.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	276.00	282.00	262.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	83.00	86.00	80.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	23.12	23.37	23.39	
5	Average Aggregate impact value	(%)	23.29			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

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CONSULTANTS

Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	9th cross Road	**Date of Sampling**	**16-07-2021**
		Date of Testing	**17-07-2021**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	642	76	542	76
16.0	12.5	1136	128	980	108
12.5	10.0	778	58	732	55
10.0	6.3	618	64	542	52
Total		**3174**	**326**	**2796**	**291**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.27
Elongation Index(%):	10.41
Combined FI+EL (%)	20.68

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Name of Work	:	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	17-07-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 1

GRADATION FOR WMM

(As per MORT&H 400-11)

Sample Location:	9th cross Road	**Date of Sampling:**	16-07-2021
		Date of testing:	17-07-2021
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	376	370	3.70	96.30	95-100
22.4	1799	2169	21.69	78.31	60-80
11.2	2253	4422	44.22	55.78	40-60
4.75	2020.0	6442	64.42	35.58	25-40
2.36	1392.0	7834	78.34	21.66	15-30
0.6	775.0	8609	86.09	13.91	8.0-22.0
0.075	885.0	9494	94.94	5.06	0-8
Pan	506.0	10000			
Total	10000.0				

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Consultant's Representative

ಸಹಾಯಕ ಕಾರ್ಯ[illegible] ಅಧಿಕಾರಿಯವರು
ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
ಬಿ.ಬಿ.ಎಂ.ಪಿ., ಬೆಂಗಳೂರು-24

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TEJUS

Name of Work	:	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS, BANGALORE
Contractor	:	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing	:	19-07-2021
Type of Mix	:	WMM
Sample I/D	:	WMM 2

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	6th C cross Road	Date of Sampling:	18-07-2021
		Date of testing:	19-07-2021
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	390	390	3.90	96.10	95-100
22.4	2382	2772	27.72	72.28	60-80
11.2	2480	5252	52.52	47.48	40-60
4.75	1456.0	6708	67.08	32.92	25-40
2.36	793.0	7501	75.01	24.99	15-30
0.6	860.0	8361	83.61	16.39	8.0-22.0
0.075	993.0	9354	93.54	6.46	0-8
Pan	646.0	10000			
Total	10000.0				

Note:

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3. Any Query regarding the report must be reported reported within 15days from the date of testing.
4. The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

TEJUS CONSULTANTS

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Project	Improvements to roads and drains at Kogilu and surrounding area in Ward No 05 Byatarayanapura sub division
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Consultant	TEJUS CONSULTANTS, BANGALORE
Contractor	M/S Benaka Developers and Projects Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material		WMM		**Proposed Use**	**WMM**
Sample Location		6th C cross Road		**Date of Sampling**	**18-07-2021**
				Date of Testing	**19-07-2021**
Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	630	83	532	75
16.0	12.5	1136	115	1005	122
12.5	10.0	765	68	739	53
10.0	6.3	618	50	572	45
Total		**3149**	**316**	**2848**	**295**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.03
Elongation Index(%):	10.36
Combined Fl+EL (%)	20.39

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Consultant	TEJUS CONSULTANTS, BANGALORE	
Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
Date of Testing	**20-07-2021**	
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**9th cross Road at Ch:35**	**9th cross Road at Ch:105**
Wt. of wet material from hole (Ww) gms.	5985	5978
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10588	10596
Wt. of sand in hole+ cone (w3) gms.	4412	4404
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3332	3324
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	6.20	6.40
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.23	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.35	98.29
% compaction required	98%	98%

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Contractor	M/S Benaka Developers and Projects Pvt Ltd	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**20-07-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**9th cross Road at Ch:190**	**9th cross Road at Ch:260**
Wt. of wet material from hole (Ww) gms.	5992	5986
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10596	10588
Wt. of sand in hole+ cone (w3) gms.	4404	4412
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3324	3332
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.38	2.37
Moisture meter reading(moisture content)	6.30	6.30
Result		
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.24	2.23
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.61	98.28
% compaction required	98%	98%

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